LISA RFI

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<SUBJECT>A-- Request for Information (RFI), Laser Interferometer Space Antenna (LISA)

<SOLNBR>N/A

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<DESC> The Laser Interferometer Space Antenna(LISA) is a joint NASA/ESA Mission to measure gravitational radiation with a space-borne sensor. The LISA Project Office at the Goddard Space Flight Center (GSFC) is soliciting information from industry to support planning for a Systems Engineering and Integration (SE&I) contract. A phased procurement is planned with the initial award in Feb of 2004.

The objective of the LISA mission is to observe gravitational waves from galactic and extra-galactic binary systems, including gravitational waves generated in the vicinity of the very massive black holes found in the centers of many galaxies. Gravitational waves are one of the fundamental building blocks in our theoretical picture of the universe. Although there is strong indirect evidence for the existence of the gravitational waves, they have not yet been directly detected.

The LISA flight segment consists of a constellation of three spacecraft in the shape of an equilateral triangle, $5X10^6$ km on a side. The center of the triangle formation will be in the ecliptic plane one astronomical unit (AU) from the Sun and 20 degrees behind the Earth.

The constellation of three spacecraft measure the distortion (strain) of space-time caused by passing gravitational waves. Each spacecraft will contain two free-floating "proof masses." These proof masses define optical paths 5 million km long, with a 60-degree angle between them. Lasers in each spacecraft will be used to measure changes in the optical path lengths with a precision of 20 picometers.

Subject to formal approval, the project starts development (Phase C/D) in the year 2007 with a launch in 2011. The LISA web site (http://lisa.nasa.gov) describes the science objectives of the mission; the proposed mission itself, the spacecraft and instruments; some of the technology challenges that must be met; and a background primer on gravitational waves. Select a section heading at the left to find out more about the LISA mission.

The LISA mission is planned as a bilateral and mutual partnership with the European Space Agency (ESA). While contributors are still under negotiation, the following should be assumed:

ESA:

- Mission Management and System Engineering Partner
- Management of all European contributions
- Delivery of three spacecraft

European Member States:

- Science team co-chair and membership
- Instrument/systems technology and instrument components

NASA/Goddard:

- Mission Management and System Engineering Partner
- US management and systems engineering lead
- Systems integration
- Instrument/systems technology

NASA/Jet Propulsion Laboratory:

- Science management
- Payload management and Systems engineering

- Instrument/systems technology and instrument components Mission design, mission operations planning and execution

As a result of this Request for Information (RFI), NASA anticipates entering into a Partnering Phase activity with potential offerors who are determined to be viable competitors for the SE&I contract (see below). The acquisition schedule is as follows:

- **March 2003 - January 2004 Partnering Phase:** Viable competitors will be given the opportunity to meet with the Government, both in groups and in one-on-one sessions. During this Phase there will be exchanges of information that will enable potential offerors to prepare for the subsequent acquisition, and to make recommendations to the Government concerning its requirements and its acquisition approach.

- **February 2004 - March 2005 Preparation Phase:** Two Contractors will provide parallel analyses and support services in support of the Formulation Phase of the LISA Mission and will finalize a plan to continue such support through completion of the LISA Mission. This phase will result from a Request for Proposals (RFP) to be issued in October 2003, with contract award in February 2004. The Government anticipates awarding two parallel Firm-Fixed-Price (FFP) contracts, each worth ~$TBD M.

- **April 2005 - Project Completion –Execution Phase:** A single Contractor will provide all of the remaining SE&I support services required for LISA. The Contractor will be chosen using Phased-Acquisition down-select procedures. The instructions to offerors for the down-selection will be issued in September 2004. The Government anticipates a Cost-Reimbursable contract with Award and Incentive features.

The scope of work of the SE&I contract is expected to be as described in the following paragraph. However, this scope is very preliminary at this time. The Government anticipates that during the Partnering Phase, it will solicit input and recommendations that will be considered in determining the scope of work for the subsequent Request for Proposal.

Scope of Work for SE&I Contractor

The LISA project will use Integrated Technical Teams throughout formulation and implementation to facilitate and coordinate activities across the various partners. NASA will use the SE&I contractor to augment and coordinate activities between these ITT's. These tasks may include:

- Requirements flowdown,
- System verification and validation
- Interface definition and management
- Operations concept definition
- Design definition,
- Software system engineering
- Risk management.

In addition, contractor may be responsible for:

- Planning, coordinating, and executing the payload and observatory integration and test
- Definition and implementation of LISA's knowledge management systems
- Designing and building Ground Support Equipment and test fixtures.
- Development and test of the mission software.

Presolicitation:

This RFI is a solicitation for information and planning purposes. NASA has posted certain information at **http://lisa.gsfc.nasa.gov/Business/Business.html** to enable potential offerors to learn more about the LISA Program, and to enable them to respond to this RFI. The information contained on this web site is essential for developing an understanding of the LISA program. Of particular importance is the Technology Readiness and Implementation

Plan (TRIP), which contains some discussion of the role of the LISA SE&I contractor.

The objective of this RFI is: to invite potential offerors to submit information that allows the Government to advise the offerors about their potential to be viable competitors; to promote competition; to improve potential offerors' understanding of the Government's requirements; and to improve the Government's knowledge of industry's capabilities. Prospective offerors are invited to submit comments for any possible improvements to the Government's acquisition approach.

This preliminary information is being made available for planning purposes only, subject to FAR Clause 52.215-3, entitled "Solicitation for Information or Planning Purposes." It does not constitute a Request for Proposal, Invitation for Bid, or Request for Quotation, and it is not to be construed as a commitment by the Government to enter into a contract. This procurement is subject to review or cancellation at any time.

This notice constitutes all information concerning the LISA SE&I procurement that will be furnished at this time. Firms interested in obtaining other information must submit a request, in writing, to Jerry Edmond, Code 210.6, NASA/GSFC, Greenbelt, Maryland 20771. Please do not request other information until you have read the documentation available through the web site described above.

Offerors who intend to respond with a qualifications statement are requested to notify Colleen McGraw at cmcgraw@pop700.gsfc.nasa.gov within two days of receiving this notice. Interested firms are requested to submit their capability statements, as well as any comments and suggestions on the acquisition approach to the address cited above. Capability statements must be submitted within 21 calendar days of the date of this notice.

It is the responsibility of potential offerors to monitor the NASA Acquisition Internet Service for information concerning the release of future solicitations.

B. Government Assessment of viability

1. NASA invites potential offerors to submit information that will allow it to advise them of their potential to

be viable competitors. This procedure is described in Part 15.202 of the FAR. NASA desires to have one-on-one meetings with all offerors who are considered to be viable competitors. These meetings will allow for exchange of information and will provide an opportunity for you to provide feedback on the Government's requirements and its acquisition approach. In order to be evaluated for your viability, you must submit the information described below. NASA will utilize this information in order to advise you of your potential to be a viable competitor for the LISA SE&I contract.

2. Information Requested – provide a capabilities and qualifications statement that includes:

   - A discussion of your past experience in providing SE&I support similar in nature to that needed for LISA, including a listing of contracts/subcontracts, and a brief description of the quality of your performance of these contracts.

   - A brief description of your human resources, facilities, and all other resources necessary for supporting LISA SE&I. Discuss the availability of your facilities and other resources.

   - A demonstration of your understanding of the LISA program and the role of the SE&I support contractor, as evidenced by the following:

     - Describe the unique challenges that the LISA Mission requires for successfully performing the System Engineering support function, addressing WBS elements 1.2.2 through 1.2.9 (see page H-27 of the LISA TRIP Report), and your approach to dealing with those challenges.

     - Describe the key challenges that must be addressed in developing Mission Software (WBS element 1.10), the potential for using flight software as an integrating backbone for the LISA Mission, and your approach to dealing with those challenges and potential.

     - Describe the key challenges that must be addressed in performing the System Integration &

Test function (WBS element 1.2.10), and your approach to dealing with those challenges.

- Describe your approach to dealing with the challenges of ITAR in the LISA environment

This statement should be no more than 20 pages (8.5" x 11") in length.

3. NASA will evaluate the submitted capability and qualification statements by considering the following:

- The depth and relevance of experience and past performance history, which convey a demonstrated ability to successfully perform the SE&I support needed for LISA

- The adequacy and availability of necessary human resources, facilities, and other resources for implementing and performing the LISA SE&I contract.

- The proper identification of the key challenges and potential associated with the System Engineering, Mission Software, and Mission Integration & Test Functions for the LISA mission, and the effectiveness of your approach in dealing with these.

- The effectiveness of your approach to dealing with the challenges of ITAR in the LISA environment

C. NASA's evaluation of capability and qualification statements

NASA will advise each respondent, in writing, as to our assessment of viability as a competitor under this potential acquisition. To be considered a viable competitor, you must be rated viable for all three criteria. NASA anticipates completing this evaluation within two weeks of receiving qualification statements. NASA may ask for supplemental information to your qualification statement if there is uncertainty as to your viability. You will be contacted after this evaluation with the results. If you are found to be viable, you will be contacted to set up future meetings. If you are found not to be a viable competitor, NASA will advise you as to the basis for that determination. Non-viable respondents

may request a one-on-one meeting by sending a written request to the Contract Specialist, Jerry Edmond, at the address listed above.